Gym_log_2024

Case Study created by Jan Mikloško.

15th May 2024

I aim to learn Python Pandas and track the progress of my workout routine. This is my first case study. Visualizations were created entirely in Python using Matplotlib and Seaborn libraries. Data were collected in Google Spreadsheets since 1st January 2024. Cleaning was primarily conducted in MS Excel.

Content

Introduction:

Goals:

- Clean collected data and prepare it for analysis.
- Exercise Python for data analysis and learn to use Python libraries such as Pandas, Matplotlib, Seaborn, Numpy, etc.
- Gain insight to my workout routine, body transformations and daily habits in the first half of the 2024.

Output:

- Report about my findings in PDF

Extra on github:

- Source files
- Individual Python files
- Additional files such as images or readme files

Tech:

- Python
- Pandas, matplotlib, seaborn, numpy
- Git
- VS Code

Github repository: https://github.com/mikloskoj/Gym_log_2024

Analysis intention:

Analysis specifics:

- Compare calorie consumption and body macros.
    - vizualize.
    - calculate correlation between caloric intake and body weight/waist.
- Calculate and visualize BMI
- Workout consistency. Days, duration, total sets.. etc. (Maybe heatmap or some similar visual)
- Most favorite exercise.
- Least favorite exercise.
- Longest workout duration/sets.
- Shortest workout duration/sets.
- Number of sets per muscle group.
- Weight load progress across few selected exercises.
    - Dip assist
    - Bench press
    - Pec fly
    - Leg extension
    - Mid row - one arm

- Check how reps per sets has changed in correlation to weight.

- Most worked muscle group (total sets table).

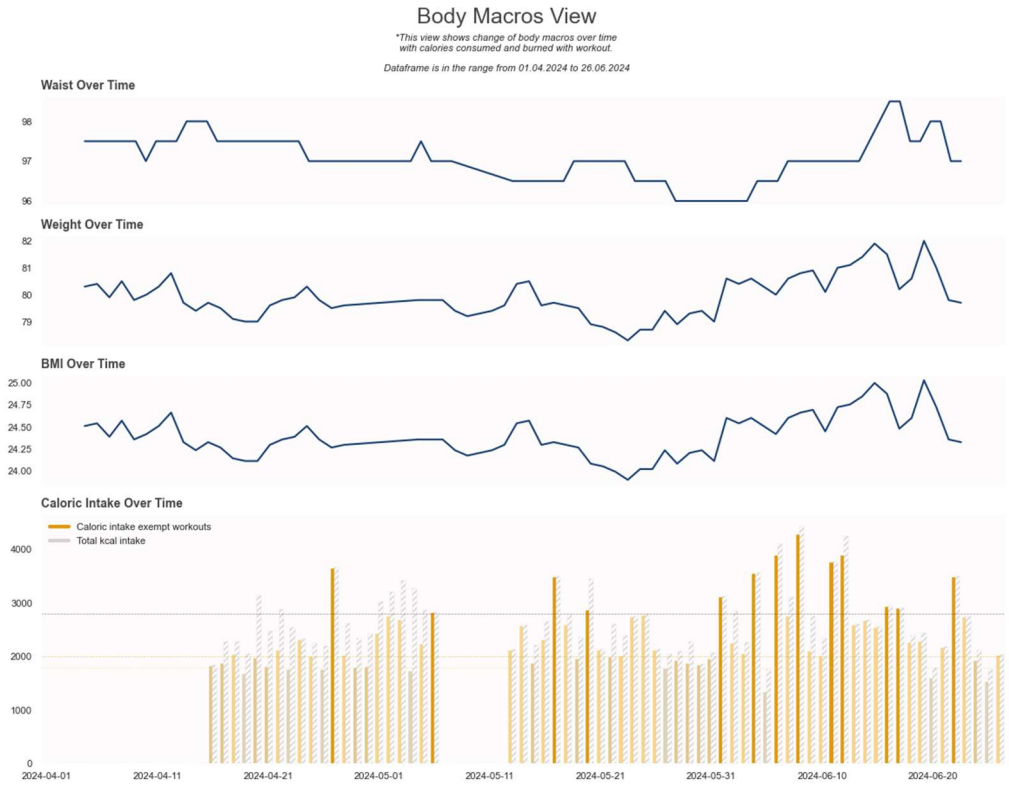
Analysis:

01 - Body macros

In this first part of a analysis I wanted to see changes of my weight and waist over time.

The lower bar chart illustrates my calorie consumption:

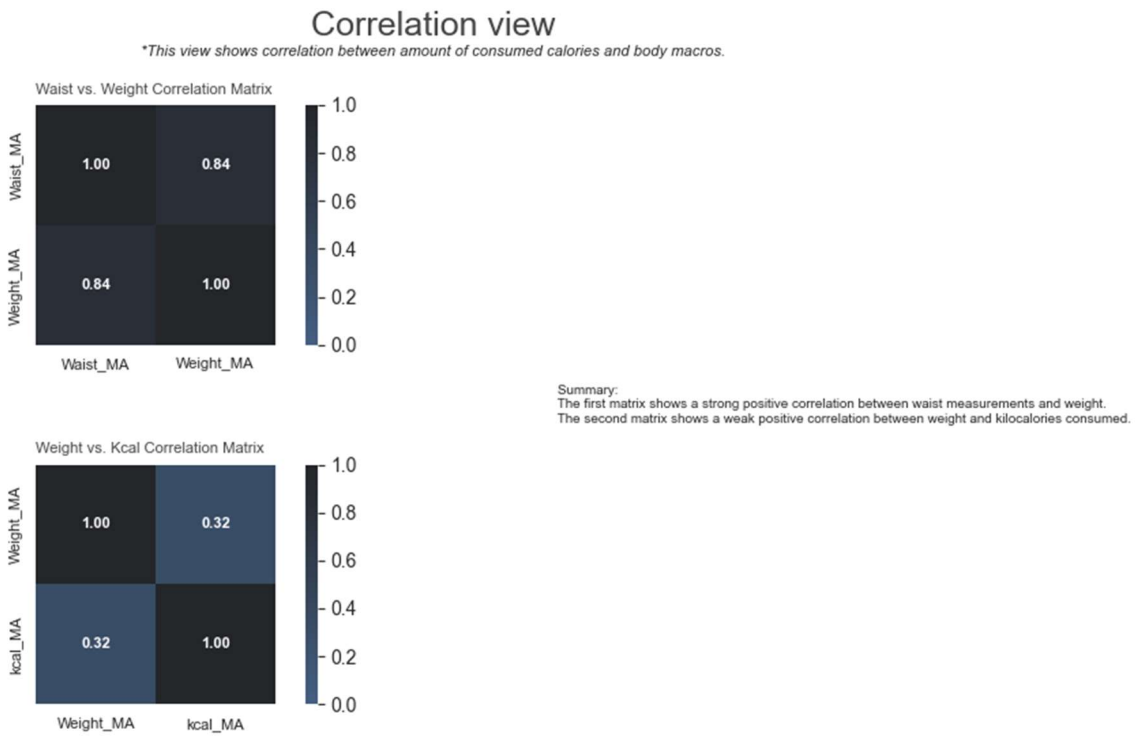
The orange bar represents caloric intake minus the estimated calories burned through workouts.
The grey bar represents total calories consumed.



As you can see, when caloric intake exceeds 2000 kcal, the weight increases. I verified this by creating a correlation heatmap, as shown on the next page.

In the first plot, you can observe a strong positive correlation of 0.84, indicating that as weight increases, waist proportions also tend to increase.

The second plot displays the correlation between calories consumed and weight. While the correlation is positive, it is not very strong. This confirms my hypothesis to some extent and suggests that changes in weight may be influenced by other factors not included in the dataset.

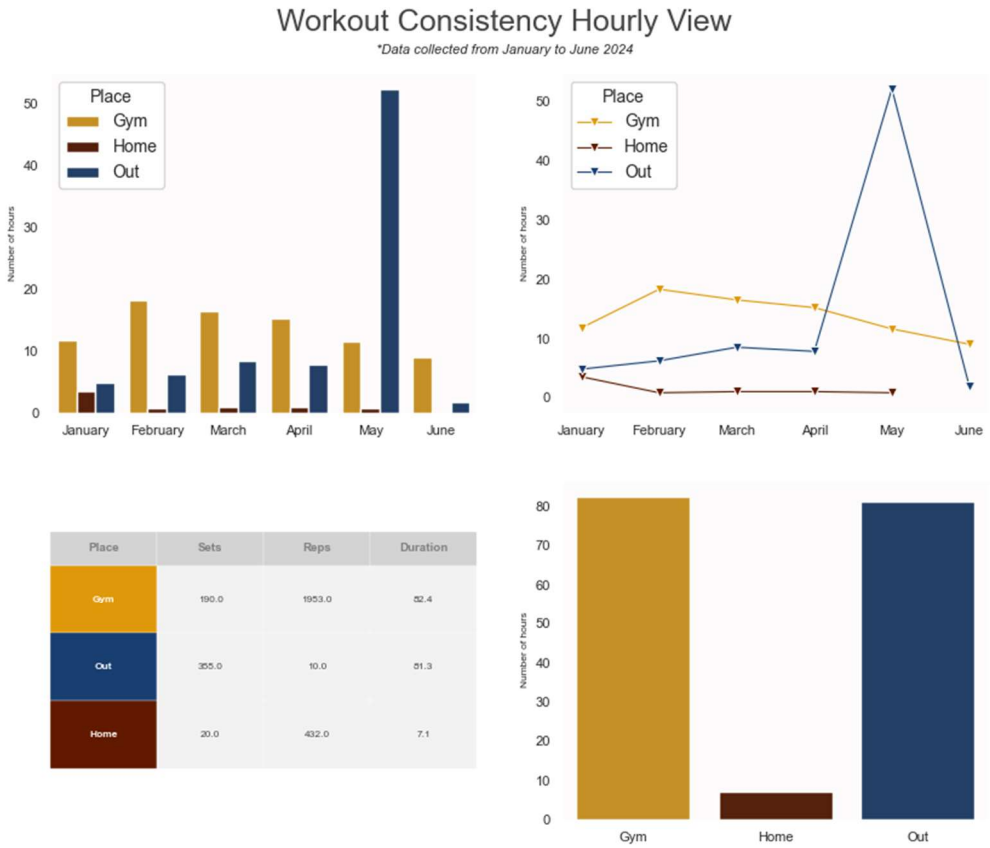


02 - Workout Analysis and Consistency

In the second part, I examined my workout consistency.

From the plot below, you can see that the gym was the preferred place for exercise.

The first thing you notice is the outlier in May: a multi-day hike across the Nízké Tatry in Slovakia. Each day averaged 8 to 10 hours.



In the provided table, the number of repetitions for outdoor activities is relatively low. This is because I do not track repetitions for cardio activities such as running or walking. Instead, I track sets, where one set equals one kilometer.

1 set = 1 kilometer

The favorite muscle group by far is the Chest. Cardio workouts were excluded from the dataset.

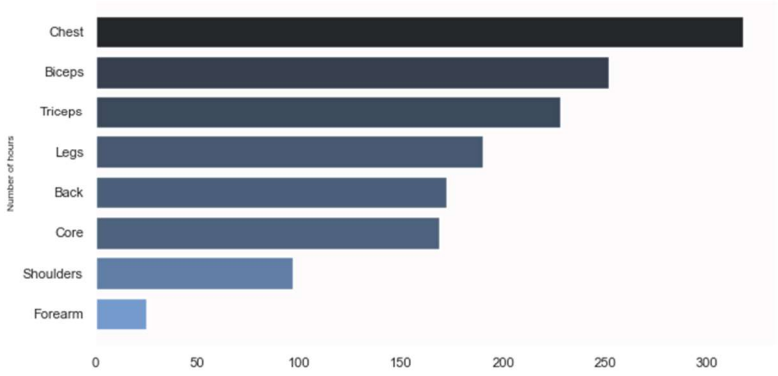
Workout Consistency view

**Cardio workouts were exempt from the dataset.*

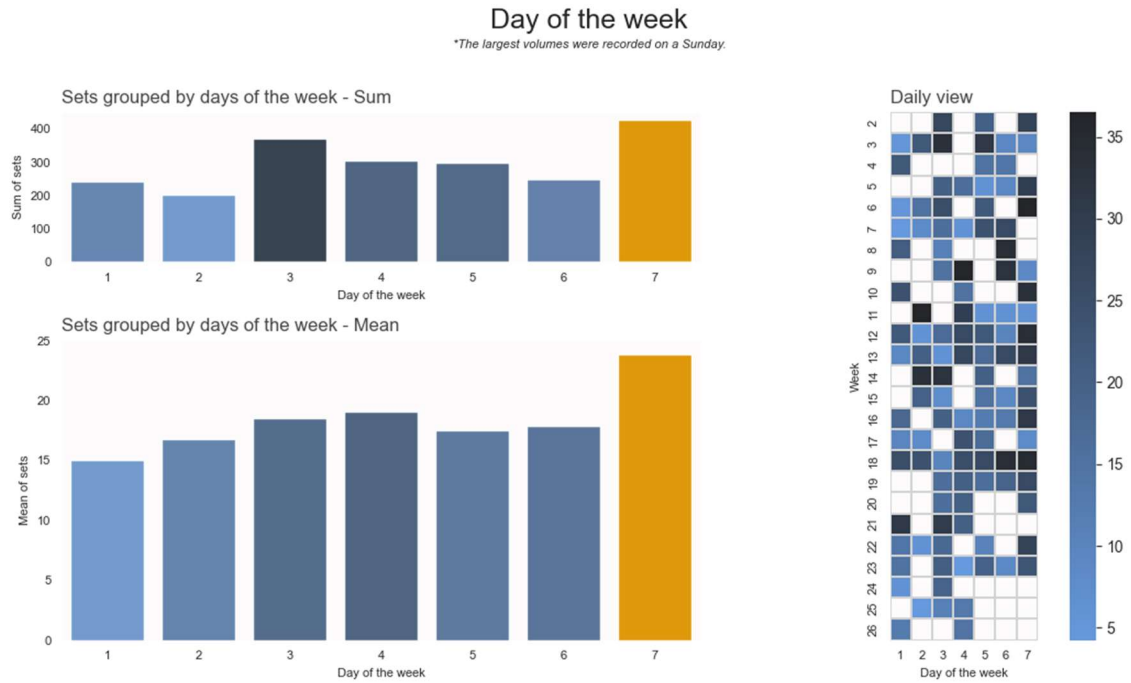
Sum of Repetitions by Muscle Group

Muscle group	Sets	Reps	Weight
Chest	318.0	10789.0	7720.0
Biceps	252.0	7544.0	2931.25
Triceps	225.0	6562.0	5465.0
Legs	190.0	7740.0	5535.5
Back	172.0	4555.0	4455.0
Core	169.0	11550.0	5265.0
Shoulders	97.0	3151.0	955.0
Forearm	25.0	1254.0	76.0

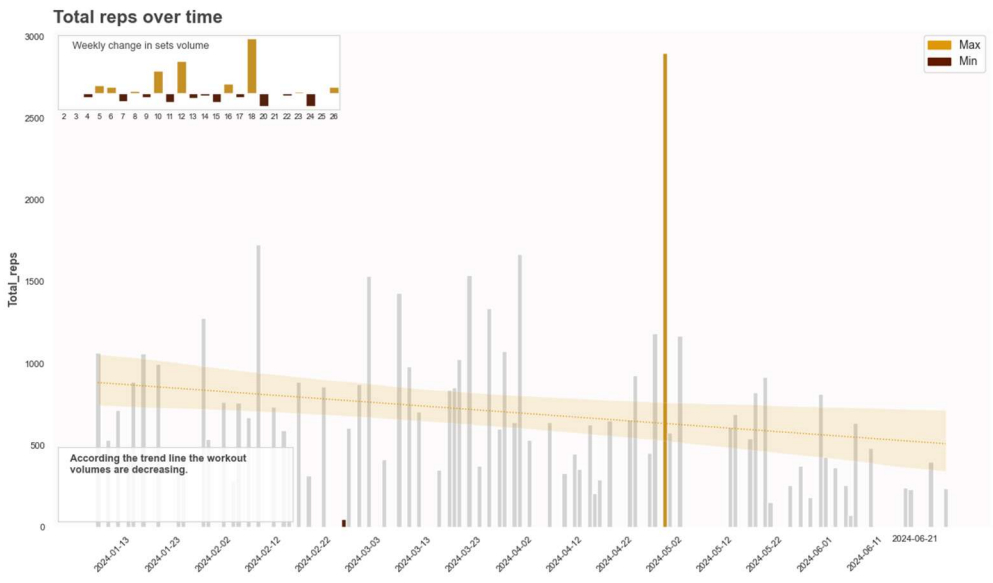
Sum of Repetitions by Muscle Group chart



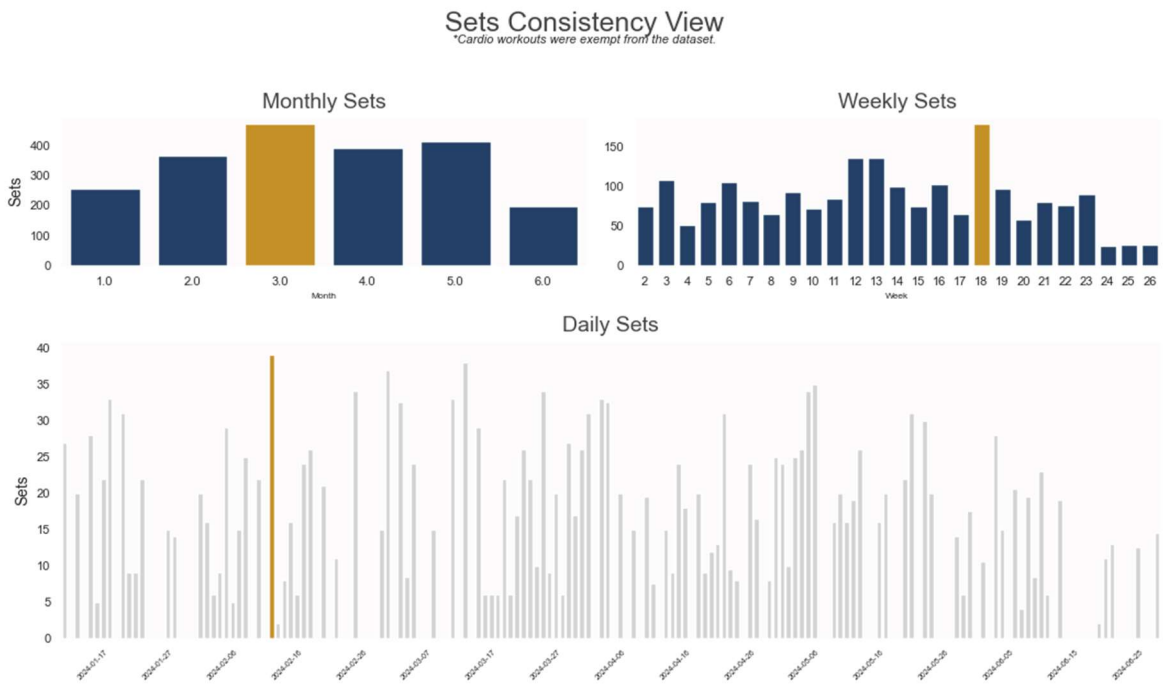
Sundays were dedicated to catching up on volumes, averaging almost 25 sets per workout.



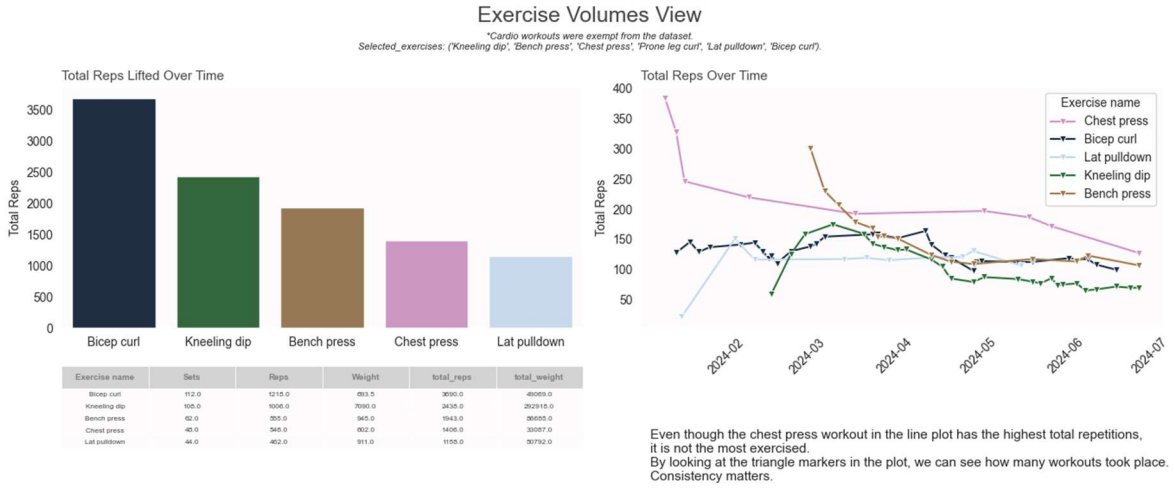
Overall consistency showed a slight decrease, as observed in the chart below.



As you can see on the bar plot below, March and May had the highest volume.



This view shows the top 5 exercises I did most frequently. The Bicep curl and Kneeling dip were my favorite exercises.



Even though the chest press workout in the line plot has the highest total repetitions, it is not the most exercised.
By looking at the triangle markers in the plot, we can see how many workouts took place.
Consistency matters.

03 – Overall Conclusion

From January to June 2024, I found that eating more than 2000 calories often led to weight gain. There's a clear link between weight gain and waist size increasing. However, factors other than calories also affect weight. I mainly worked out at the gym, but a long hike in May stood out. I didn't track cardio exercises like running or walking in detail. Going forward, I'll focus on keeping up my workout routine and exploring what else affects my weight.

This list will stay unchanged, but I will update the dataset and Python file monthly to track my ongoing progress.

Thank you note:

Thank you for reviewing this. I would appreciate feedback, so please don't hesitate to contact me.

Have a nice day.

Jan Mikloško

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